

The Librarian, Mr. Ord, reported that he had surrendered to Mr. F. Blake, applying on behalf of the family of Captain Rogers, the log-book of the steam-ship Savannah, which had been deposited with the Society by the late Vice President Hopkinson, on the 3d of April, 1840.

On motion of Mr. Walker, a Committee was appointed to make and collect observations on the solar eclipse of Dec. 9. The Committee appointed were Mr. Walker, Dr. Patterson, Prof. A. D. Bache, Prof. Kendall, Mr. R. T. Paine, Prof. Alexander, Prof. Frazer, Prof. Bartlett, Mr. Lukens, Prof. Loomis, Prof. Norton, Prof. Locke, Mr. Gummere, Mr. Chas. J. Wistar, Prof. Courtenay, Prof. Cresson, Prof. Peirce, Mr. Borden, Mr. Downes, and Mr. Charles M'Euen.

Stated Meeting, Dec. 20.

Present, thirty-nine members.

Dr. PATTERSON, Vice-President, in the Chair.

Letters were announced and read:—

From the Academy of Natural Sciences of Philadelphia, dated Philadelphia, Dec. 9, 1844, acknowledging the receipt of a copy of Dr. Dunglison's discourse on the late President of the Society:—and,

From Mr. Dudley Leavitt, dated Meredith, November, 1844, accompanying tables of the moon's rising and setting.

Professor Perry, of the United States' Navy, member of the Maryland Academy of Sciences, was introduced by Mr. Walker, and took his seat.

The following donations were announced:—

FOR THE LIBRARY.

The Twenty-eighth Report of the Directors of the American Asylum, at Hartford, for the Education and Instruction of the Deaf and Dumb. Exhibited to the Asylum, May 11, 1844. Hartford, 1844. 8vo.—*From the Directors.*

An Introductory Lecture to the Course of Institutes of Medicine, &c.,

- in Jefferson Medical College. Delivered Nov. 4, 1844. By Professor Dunglison. 8vo.—*From the Author.*
- Introductory Lecture to the Course of Chemistry, delivered in Jefferson Medical College, Nov. 3, 1841. By Franklin Bache, M.D. 8vo.—*From the Author.*
- Introductory Lecture to the Course of Chemistry in Jefferson Medical College. Delivered Nov. 6, 1843. By Franklin Bache, M.D. 8vo.—*From the same.*
- Introductory Lecture to the Course of Chemistry, delivered in Jefferson Medical College, Nov. 1844. By Franklin Bache, M.D. 8vo.—*From the same.*
- An Inquiry into the Distinctive Characteristics of the Aboriginal Race of America. By Samuel George Morton, M.D. Second Edition, 1844. 8vo.—*From the Author.*
- A Memoir of William Maclure, Esq. By Samuel George Morton, M.D. Second Edition, 1844. 8vo.—*From the same.*
- On a supposed New Species of Hippopotamus. By S. G. Morton, M.D. From the Proceedings of the Academy of Natural Sciences of Philadelphia, for February, 1844.—*From the same.*

The Committee, consisting of Dr. Meigs, Dr. Dunglison, and Dr. Hays, on the paper of Dr. Bond, entitled, "Case of Spina Bifida," read at the last meeting of the Society, presented a report thereon, recommending that an abstract of the same be made by the Reporter, to be published in the Proceedings of the Society; which recommendation was agreed to.

The child was born at term, July 5, 1833; the mother aged 40 years. The pregnancy went several days beyond the reckoning.

Upon washing the child, a spot as large as a half cent, looking like a coagulum, but covered with a thin film of membrane, was discovered at the lower end of the lumbar spine. It was destitute of the common integument, and was not raised above the surface. The spinous processes on the sacrum were absent; those of the lumbar vertebræ were present.

On the third day, the tumour was as large as a walnut, and continued steadily to increase in size, until it opened on the 27th of August, fifty-three days after the birth of the child. Although, for the first few weeks, the tumour exhibited a low and suppurating surface, yet it afterwards became covered with a tense, glossy, heated surface,

except at three distinct points, through one of which the contents were discharged.

Dr. Bond's note of the case is accompanied with drawings representing the tumour as to colour, size, vascularity and situation. The sac filled and burst repeatedly,—the fluid discharged becoming, at each successive opening, more and more turbid, and lastly puriform; while the sac acquired after each opening, an increased thickness and consistency. In the first six weeks, the health of the infant suffered but little; but at length it began to be emaciated, and to be much distressed, but was greatly relieved of uneasiness after each discharge. It died on the 69th day.

The third drawing, by Drayton, exhibits the tumour and the spine dissected. The lower terminus of the spinal cord was found within the sac; that is to say, it had passed out of the spinal canal, and with its terminal nerves was enveloped in the thickened membranes and tissues of which the sac was composed—chiefly *dura mater* altered by inflammation.

Dr. Bond refers to two cases treated by Sir Astley Cooper. He was deterred from making punctures in the tumour in this case, and it is evident from the dissection, that such treatment would have been unavailing.

The Committee, consisting of Dr. Patterson, Mr. E. Morris, and Professor Kendall, on Mr. Nulty's communication, entitled "Supplementary Note on the Construction and Different Forms of the Magic Cyclovolute," as published in the Transactions of the Society, Vol. IV. 1835, recommended the publication of the same in the Transactions. Publication was ordered accordingly.

The particular arrangement there described, the author deduces in his present paper from a combination of elementary magic squares of peculiar forms, and shows that from different combinations of such squares, and with attention to every property involved in the original drawing, there may be constructed 768 magic cyclovolutes. A slight limitation with regard to secondary properties enables him to extend the number of arrangements to 6144; and these he further increases to 55296 different magic cyclovolutes, with all the general properties enumerated in his first paper.

In connexion with his subject, the author presents a *new* magical arrangement, analogous to that employed by Dr. Franklin in the construction of the magic circle; but which, including more extensive

properties, imparts to it further generality. He finds 1536 magic circles with his own additional improvement here implied; 7680 of Dr. Franklin's limited construction; and finally 55296 magic circles, with further limitation, including, however, the chief property of the *sixteen* radii, and all the properties assigned to the *twenty-eight* principal and secondary rings of the magic circle.

The principles on which are founded the preceding results, the author judges of moment in respect to the magical combination of numbers; and mentions, as an instance, their immediate application to the extensive series of 256 numbers 1, 2, 3—256, first magically combined by Dr. Franklin, and afterwards by Mr. Dalby, professor in the Royal Military College, as cited by Dr. Hutton. For the purpose of comparison and remark on this subject, a *new* perfect magic square is given. It embraces the preceding series, and is capable of being made the basis of an enlarged magic cyclovolute. A corresponding arrangement is alluded to in case of a generalized magic circle, the number and varieties of which, as well as those of a magic cyclovolute, however extensive, the author conceives to be within the design and general scope of his solution.

Mr. Walker, from the Committee on the Solar Eclipse appointed at the last meeting, reported progress, and stated, that he had received letters from Professor Pierce of Harvard University, Professor Loomis of the New York University, and Professor Barnard of the University of Alabama, containing the observations on the eclipse made by those gentlemen.

A paper, containing Tables of the Moon's rising and setting, by Mr. Dudley Leavitt, was read by the Secretary, and referred to a Committee, consisting of Mr. Walker, Dr. Patterson, and Professor Kendall.

Mr. Justice stated, that glasses of immense magnitude for telescopes were now fabricated at Paris,—a circumstance on which doubt had existed in the minds of members when it was first mentioned at the meeting of the Society of the sixteenth of August. He also referred to interesting observations on the Moon's surface, made with the telescope of Lord Rosse, and with the refractor at the High School observatory of this city;—the latter distinctly exhibiting the same appearances as had been observed with the former.

A communication was read from Mr. J. P. B. Maxwell,

containing additional information in regard to the Mastodon bones, on which a communication from him was read at the last meeting.

In the description of the bones communicated to the Society at that time, Mr. Maxwell omitted to mention one circumstance, which struck him as peculiar. The back grinders, which had not yet cut through, were placed so far back, that they could be of no use to the animal in that position, and it appeared evident, that only two grinders could be in use at the same time, and that as the forward ones were worn out they would be shed, and their place supplied by those behind pushing forward;—a beautiful provision—Mr. Maxwell conceives—for an animal of long life subsisting upon hard substances.

Professor Henry, of Princeton, made an oral communication in regard to some speculations in which he had indulged, relative to the classification and origin of mechanical power.

He stated, that he was indebted for the origin of this train of thought to some remarks made by Mr. Babbage in his work on the economy of machinery, and to the late researches of the German and French chemists on the subject of vital chemistry; indeed, all the views contained in the communication, might perhaps be found in detached portions in different works; but he believed, that they had never before been brought together and presented as a whole.

He defined mechanical power to be that which is capable of overcoming a constant resistance, and of producing a continued motion; or, in the language of the engineer, it is that which can be employed to “do work.” It is here used in a more restricted sense than force, which is applied, as a more general term, to whatever tends to produce or resist motion. The following list of mechanical powers, he believed, would be found to include all the prime movers employed at the present time, either directly or indirectly, in producing mechanical changes in matter, and all these could be referred to two sources:—

Class 1st.	{ Water power, Tide power, Wind power, }	Referable to celestial disturbance.
Class 2d.	{ Steam and other powers developed by combustion. Animal power. }	Referable to that which is called vital action.

These natural motive principles are not always directly employed in producing work, but are sometimes used to develop other power, by disturbing the natural equilibrium of other forces, and in this way, they give rise to a class of mechanical movers, which may be called intermediate powers. It will be evident on a little reflection, that the forces of gravity, cohesion, and chemical attraction, with those of the imponderable agents of nature, so far as they belong to the earth, all tend to produce a state of stable or permanent equilibrium at the surface of our planet,—that in all cases, before the energies of these forces can be exhibited, the disturbing effect of some extraneous force is required,—hence these principles in themselves are not the primary sources of power, but are merely secondary agents in producing mechanical effects;—or, in other words, it will be found, that while the approximate source of every power is the force exerted by matter, in its passage from an unstable to a stable state of equilibrium, yet, in all cases, it may be referred beyond this to a force which disturbed a previously existing quiescence. As an example, we may take the case of water power, in which the mechanical effects are approximately due to the return of the water to a state of stable equilibrium on the surface of the ocean; but the cause of the continued motion is the force which produced the original disturbance, and which elevates the liquid in the form of vapour. Also, in the phenomena of combustion, the immediate source of the power, evolved in the form of heat, is the passage from an unstable state into one of stable combination of the carbon and hydrogen of the fuel, and the oxygen of the atmosphere; but this power may ultimately be resolved into the force which caused the separation of these elements from their previous combination in the state of carbonic acid and water.

Now the only forces of any importance, which operate at the surface of the earth to counteract the tendency to a general state of stable equilibrium are those derived from two sources, namely, *celestial disturbance*, and what is called *vital action*; and hence all mechanical power, as well as all activity on the surface of the globe, may be referred to these two sources. The only exception to this general regulation is the comparatively limited effect of volcanic action, which is a power, from whatever source it may be derived, that must tend to exhaust itself.

Thus far the author considered his conclusions founded on well established physical laws; and perhaps here the true spirit of inductive philosophy would admonish him to stop: but they who are disposed to continue the speculation, and to consider the results of

the late researches of the German and French chemists as well established truths, may extend the generalization so as to reduce all mechanical motion on the surface of the earth to a source from without. Thus, according to Liebig, Dumas and Boussingault, the mechanical power exerted by animals is due to the passage of organized matter in the body from an unstable to a stable equilibrium; and as this matter is derived in an unstable state from vegetables, and the elements of these again from the atmosphere, it would therefore appear to follow, that animal power is referable to the same sources as that from the combustion of fuel, namely, the original force which separates the elements of the plants from their stable and original combination with the oxygen of the atmosphere. But what is this power which furnishes the plant with the material of its growth? Is it due to a constantly created vital power; or, since its effects are never directly exhibited but in the presence of light, may not the opinion of many chemists of the present day be adopted, namely, that it is due to the decomposing energy of the sun's rays, which are found to exhibit a wonderful decomposing effect in cases where no vital phenomena are present.

If this hypothesis be adopted, it must be supposed, that vitality is that mysterious principle which propagates a form and arranges the atoms of organizable matter, while the power with which it operates, as well as that developed by the burning fuel and the moving animal, is a separate force, derived from the divellent power of the sunbeam. It is true, that this is as yet little more than a mere hypothesis, and as such forms no part of positive science, but it appears to be founded on a clear physical analogy, and may therefore form the basis of definite philosophical research.

The remarks of Professor Henry gave rise to a discussion in which Dr. Hare, Professor Henry and Dr. Meigs participated.

Dr. Meigs animadverted on some observations of M. Colombat de l'Isère on diseases of the Clitoris, and detailed a case of excessive enlargement of the organ.

The clitoris was injured by a fall fourteen years ago; since which time it has been constantly increasing in size. The patient was married eight years since, and has two children. The tumour was indolent, and pendulous from the front of the os pubis; and consisted of skin and genito-urinary mucous tissue. It formed a close-sac, filled with a fluctuating mass. Dr. George Norris, sur-

geon of the Pennsylvania Hospital, opened the sac by plunging a lancet into the most dependent portion. Twenty-two ounces of dark red viscous fluid escaped, consisting of blood perfectly inodorous, and which had undergone no other alteration than that which takes place in imperforate uterus or vagina. The fluid resembled precisely that which Dr. Meigs has seen discharged in cases of atresia vaginæ. As soon as the liquid was withdrawn, the sac shrunk like a scrotum. No inflammation nor other inconvenience followed the operation, which was done in May, 1844. In November, 1844, the sac was refilling, and contained about eight ounces of fluid.

Dr. Meigs regarded the case as interesting on account of the perfect resemblance of the contained fluid to that which is occasionally preserved for months, and even for years, within the uterus, or within some part of the reproductive organs. He does not suppose that blood could be preserved for so many years within a living tissue composed of materials or substance divested of the qualities of that which composes the apparatus of reproduction. If this opinion be well founded, the case—he conceives—may serve to shed an additional gleam of light on the differential powers and qualities of the tissues whose consideration constitutes the subject of general anatomy.

Col. Biddle, on the part of the Committee of Finance, reported a recommendation of the following appropriations for the ensuing year, which were agreed to:—

Proceedings,	\$300
Binding,	200
Hall,	100
Journals,	200
General Account,	700
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	1500
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He further read a statement prepared by the Treasurer, exhibiting the character of the expenditures made by the Society for some years past, and the nature and extent of its resources.

Mr. Walker requested the loan of the large lens belonging to the Society by the High School Observatory; which was agreed to by the Society,—the Curators being instructed to effect the same.

Dr. Hare presented certain resolutions in regard to the election of officers of the Society, and moved that they be printed; when, on motion of Mr. Kane, they were laid on the table.